Feb. 19, 1952 C. R. NELSON 2,586,764

FEEDING DEVICE FOR SEWING MACHINES

Filed June 21, 1947

Fig. 1

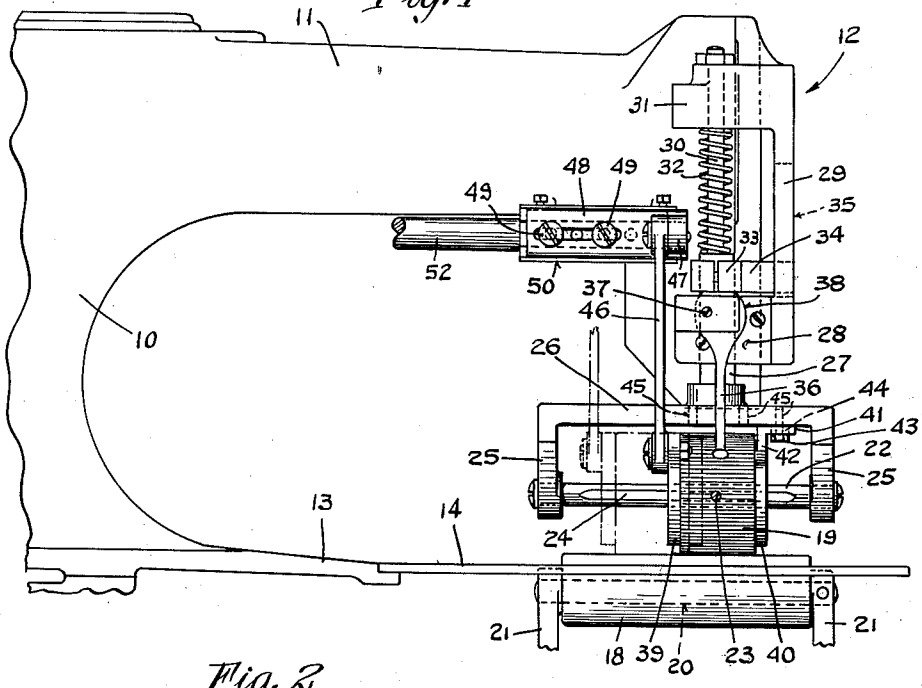


Fig. 2

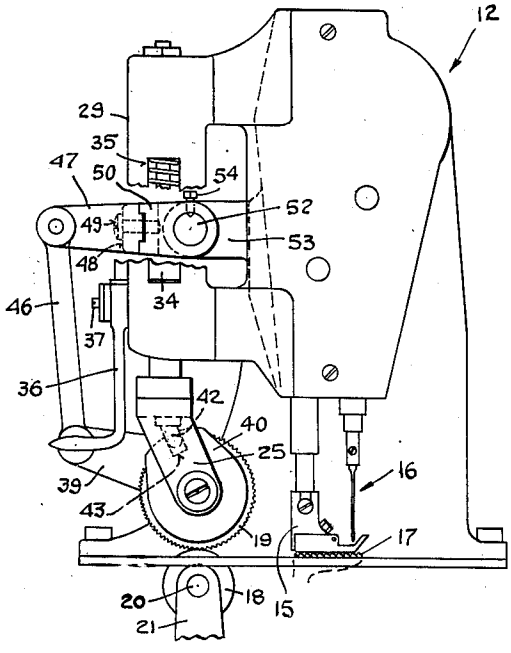
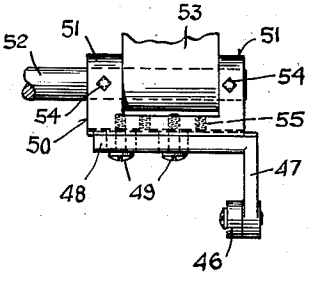


Fig. 3



INVENTOR.
Clarence R. Nelson
BY
Johnson and Kline
ATTORNEYS

Patented Feb. 19, 1952

2,586,764

UNITED STATES PATENT OFFICE

2,586,764

FEEDING DEVICE FOR SEWING MACHINES

Clarence R. Nelson, Nyack, N. Y., assignor to Wilcox & Gibbs Sewing Machine Company, New York, N. Y., a corporation of New York

Application June 21, 1947, Serial No. 756,235

11 Claims. (Cl. 112—214)

1

This invention relates to sewing machines, and more particularly to feeding devices of sewing machines.

An object of the invention is to provide an improved feeding device in a sewing machine whereby the machine is adapted not only for shirring but also for sewing both narrow and extremely wide hems with facility and accuracy.

In accomplishing this there is provided by the invention an adjustable auxiliary feeding device in the form of a puller feed which is so arranged that it may be adjusted to engage work-pieces either at a point substantially in the line of sewing, or at a point wholly to one side of the line of sewing, or at a large number of intermediate points. When the puller feed is adjusted for engaging the work in the line of sewing, it may function in the manner of the usual puller feed and may be used for shirring and other uses requiring two feeds spaced from and substantially in line with each other. When the puller feed is adjusted to engage a workpiece at a point to one side of the line of sewing, it operates as an auxiliary feeding device and has particular utility in connection with sewing large or wide hems in material, to provide an even movement of the hem, thus aiding in the sewing operation and enabling even lines of stitches to be sewed.

In the specific embodiment of the invention illustrated herein, the improved puller feed comprises a pair of cooperable upper and lower rollers of different widths, the lower roller being the wider and being mounted solely for rotative movement in a suitable support.

The upper or narrower roller is carried on a shaft having a length on the same order as the width of the lower roller, the said shaft being carried by a fork mounted on the sewing head of the machine. The upper roller is positionable by shifting it axially to various locations on the shaft which carries it, and thus it may be made to engage the work and cooperate with the lower roller at points which are located either substantially in the line of sewing, or else wholly to one side of the line of sewing. A control and driving mechanism is provided for the upper roller, the said mechanism including novel adjustable connections whereby the roller may be located in its different adjusted positions. The control mechanism has clutch means having a pair of movement controlling members one of which is secured, by an adjustable connection, to the fork supporting the shaft on which the upper roller is mounted, the other movement controlling member being connected through a link and driving arm with an adjustable connection secured to a driving

2

shaft having reciprocative turning movements. The operative position of the upper roller is related to the settings of the said adjustable connections, said connections and roller being so arranged that the roller may be located at and locked in any of a large number of different axial positions on the shaft carrying it.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a fragmentary rear elevation of a sewing machine having the improved feed means of the invention.

Fig. 2 is a side elevation of the sewing machine and feed means, and

Fig. 3 is a detail in plan view of the adjustable driving connection of the feed means.

Referring to Figs. 1 and 2, the sewing machine is shown as having a vertical post 10 carrying an overarm 11 and sewing head 12, the said post rising from a bed 13 having a work-supporting plate 14. The sewing head 12 has the usual presser foot 15 and needle mechanism 16, the presser foot being cooperable with feed dogs 17 all in the usual manner.

According to the present invention a novel and improved auxiliary feeding device is provided for use in conjunction with the presser foot 15 and feed dogs 17. The said feeding device, in the specific embodiment of the invention illustrated herein, comprises a pair of cooperable lower and upper rollers 18 and 19 respectively, the lower roller being considerably wider than the upper roller and being rotatably carried by means of a shaft 20 on a pair of supporting arms 21 located below the work-supporting plate 14 of the machine.

The upper roller 19 is mounted on a shaft 22 having a length substantially equal to the length of the shaft 20, and the roller 19 is affixed to the shaft 22 by a set screw 23 engageable with a flat 24 on the shaft. By loosening the set screw 23 the roller 19 may be shifted axially along the shaft 22, and may be fixed in different axial positions on the shaft by again tightening the set screw.

The shaft 22 is journaled in a fork comprising a pair of depending arms 25 connected together by a yoke 26 which is in turn carried by a hollow shaft 27 journaled in a bearing 28 forming part of a bracket 29 which is secured to the sewing head 12. The hollow shaft 27 slidably receives a rod 30 which extends upwardly therefrom and is secured in an arm 31 forming another part of the bracket 29. A helical compression spring 32 is carried on the rod 30 and engages the arm 31 and the upper end of the hollow shaft 27 to yieldably

urge the latter downward. The shaft 27 fixedly carries a split collar 33 having a lateral extension 34 engaging a slide 35 of the bracket 29, whereby the shaft 27, while being capable of vertical movement, is prevented from turning.

The shaft 27 and roller assemblage carried thereby may be raised or lowered at will by a manually operable lever 36 pivotally carried on a pin 37 secured in the bearing member 28, the said lever having a camming portion 38 engageable with the underside of the split collar 33. When the lever 36 is in the lowered position shown in Fig. 1 the upper roller 19 of the puller feed is in its lowered, operative position, and when the lever 36 is swung counterclockwise the camming portion 38 will raise the collar 33 and the hollow shaft 27, and accordingly raise the roller assemblage carried by the shaft and including the upper roller 19.

The rotary movements of the upper roller 19 are controlled by clutch devices of known construction, details of which are shown and described in the copending application of Albert H. Weis, deceased, Serial Number 619,762, filed October 2, 1945, now Patent Number 2,461,862, dated February 15, 1949, and entitled "Sewing Machines." The said clutch devices have members in the form of disk-like plates 39 and 40 located at opposite ends of the roller 19, said plates being hereinafter called movement-controlling members, the member 39 upon having imparted to it a reciprocative turning movement causing the roller 19 to turn intermittently in a forward direction for feeding work pieces, and the member 40 when held stationary preventing reverse turning of the roller 19.

In accordance with the invention the movement-controlling member 40 is adjustably anchored to the yoke 26 by means of a bracket 41 having a depending lug 42 entering a notch 43, Fig. 2, in the member 40. The bracket 41 is secured to the yoke 26 by a screw 43 which passes through a slot 44 in the bracket and is threaded in the yoke 26. As shown in Fig. 1, the yoke 26 has a plurality of threaded holes 45 for receiving the screw 43, and this fact, together with the provision of the slot 44 in the bracket, enables the latter to be secured to the yoke in a large number of different positions, thereby enabling the upper roller 19 to have different positions on the shaft 24 and yet providing for a locking of the controlling member 40 to the yoke.

For the purpose of imparting reciprocative turning movements to the clutch plate or controlling member 39 the member is pivotally connected through a pivot screw with a link 46 in turn pivotally connected with a driving arm 47 having a laterally extended base portion 48 secured by screws 49 to a U-shaped driving member 50, the latter having apertured ears 51 carried by a drive shaft 52 journaled in a bearing 53 on the overarm 11 of the machine. As shown in Fig. 3, the ears 51 of the U-member 50 are secured to the shaft 52 against turning by set screws 54, which may be spotted in the shaft. Referring to Figs. 1 and 3, the base portion 48 of the driving arm may be recessed in the driving member 50 to insure that these parts are maintained in properly aligned positions.

According to the present invention, the driving arm 47 is adjustably mounted on the U-member 50, both said parts thereby comprising an adjustable driving connection. In accomplishing this, the U-member 50 is provided with a plurality of screw holes 55 and the aperture in the base

portion 48 of the driving arm is made elongate, in the form of a slot. By this construction, the driving arm 47 may be located in a large number of different positions on the U-member 50, thereby enabling the upper roller 19 of the puller feed to be located in its different, adjusted positions on the shaft 22. Normally for any given adjusted position of the driving arm 47 the link 46 and the pivot screws connected thereto tend to prevent axial shifting or repositioning of the roller 19.

The driving arm 47 and base portion 48 thereof are reversible on the U-member 50, that is, the driving arm and base portion may be turned 180° so that the arm 47 is located at the left hand end of the U-member 50 as viewed in Figs. 1 and 3. By this organization, together with the relatively long slot in the base portion 58 through which the screws 49 extend, and the plurality of threaded screw holds 55 in the U-member 55, the upper roller 19 may be shifted to and operated in any desired position between the depending arms 25, to suit various conditions of sewing.

I have found that a feed device as provided above may be used in the manner of a conventional puller feed in shirring operations for example, and for this purpose the upper roller 19 is located to engage the work substantially in the line of feed of the dogs 17, as is common practice. In addition, however, my improved feed device may be so adjusted as to adapt the machine for other sewing operations in which difficulty is normally encountered. For instance, it enables a wide hem to be sewed on the machine without difficulty, by providing for uniform feeding of all portions of the hem. In accomplishing this, the upper roller 19 is shifted axially to a new position, as by loosening the set screw 23 thereof, and by changing the positions of the adjusting connections between the movement-controlling member 40 and yoke 26, and between the link 46 and drive shaft 52. A new shifted position of the roller 19 is shown by the broken lines in Fig. 1, and when in this position the roller engages the work at points which are wholly to one side of the line of feed of the feed dogs 17. This is of special advantage when sewing wide hems, since it insures a uniform feed of all portions of the hem and enables the sewing to be accurately and more easily done. Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In a puller feed for a sewing machine, cooperable feed rollers having different widths; means mounting the roller of lesser width for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the roller of greater width; and means separate from and independent of said mounting means, connected with the sewing machine for driving the roller of lesser width therefrom, said means including a pair of force-transmitting members associated with said roller, and an adjustable connection between said members, arranged to enable the roller of lesser width to be located in different adjusted positions.

2. In a puller feed for a sewing machine, cooperable feed rollers having different widths; means mounting the roller of lesser width for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the roller of greater width; and means separate from and independent of said mounting means, con-

nected with the sewing machine for driving the roller of lesser width when the latter is in different axial positions.

3. In a puller feed for a sewing machine, cooperable feed rollers having different widths, the roller of lesser width being mounted for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the roller of greater width; means connected with the sewing machine for driving the roller of lesser width therefrom, said means including a shaft and a link carried thereby; connection means between the link and roller of lesser width, providing for movement of the link when the roller is shifted axially; and an adjustable connection between the shaft and the link, arranged to enable the roller of lesser width to be located in different adjusted positions by shifting of the link on the shaft.

4. In a puller feed for a sewing machine, cooperable feed rollers having different widths, the roller of lesser width being mounted for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the roller of greater width; and means connected with the sewing machine for driving the roller of lesser width therefrom, said means including a shaft having reciprocative turning movements, including an arm and means connecting said arm with said roller to move therewith when the roller is shifted axially, and including means for adjustably mounting the arm on said shaft in different positions axially spaced along the shaft as determined by the axial position of the roller.

5. In a puller feed for a sewing machine, cooperable feed rollers having different widths; supports for said rollers respectively, the roller of lesser width being mounted on its support for adjustable positioning axially so as to be cooperable with different axially spaced portions of the roller of greater width, movement-controlling members connected with the roller of lesser width; an adjustable connection between one movement-controlling member and the support for the roller of lesser width; and means connected to the sewing machine and the other movement-controlling member for driving the roller of lesser width, said means including a second adjustable connection, and said adjustable connections being arranged to enable the roller of lesser width to be located in different adjusted positions.

6. In a puller feed for a sewing machine, cooperable feed rollers having different widths; supports for said rollers respectively, the roller of lesser width being mounted on its support for adjustable positioning axially so as to be cooperable with different axially spaced portions of the roller of greater width; a pair of clutches having movement-controlling members connected with the roller of lesser width; an adjustable connection between one movement-controlling member and the support for the roller of lesser width; and means connected to the sewing machine and the other movement-controlling member for driving the roller of lesser width, said means including a second adjustable connection, and said adjustable connections being arranged to enable the roller of lesser width to be located in different adjusted positions.

7. In a puller feed for a sewing machine, cooperable feed rollers having different widths, the roller of lesser width being mounted for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the

roller of greater width; and means connected with the sewing machine for driving the roller of lesser width therefrom, said means including an adjustable connection comprising a pair of apertured members, and comprising screw means passing through the apertures of the members for securing the same together, an aperture of one member being elongate and said connection being arranged to enable the roller of lesser width to be located in different adjusted positions.

8. In a puller feed for a sewing machine, cooperable feed rollers having different widths; supports for said rollers respectively, the roller of lesser width being mounted on its support for adjustable positioning axially so as to be cooperable with different axially spaced portions of the roller of greater width; movement-controlling members connected with the roller of lesser width; an adjustable connection between one movement-controlling member and the support for the roller of lesser width; and means connected to the sewing machine and the other movement-controlling member for driving the roller of lesser width, said means including a second adjustable connection, and said adjustable connections each comprising a pair of apertured members, and comprising screw means passing through the apertures of the members for securing the same together, an aperture of one member of each connection being elongate and said connections being arranged to enable the roller of lesser width to be located in different adjusted positions.

9. In a puller feed for a sewing machine, cooperable feed rollers having different widths, the roller of lesser width being mounted for adjustable positioning axially so as to be cooperable with different axially-spaced portions of the roller of greater width; and means connected with the sewing machine for driving the roller of lesser width therefrom, said means including a shaft having reciprocative turning movements, including an arm connected with said roller and guided thereby, and including a two-part base extending angularly from the arm for mounting the arm on said shaft in different positions axially spaced along the shaft as determined by the guidance of the roller, one of said base parts being reversible on the other to extend the range of adjustment of the arm.

10. In a sewing machine, the combination with feed dogs and a cooperable presser foot having a predetermined line of feed, of an auxiliary puller-feed roller for feeding a workpiece leaving the feed dogs and presser foot and positioned substantially in line therewith; means including a fixed yoke mounting said auxiliary feed roller to the rear of the feed dogs, said auxiliary feed roller having a surface engageable with the top of the workpiece to feed the latter, and said mounting means including adjustable means connected to the roller for shifting said auxiliary feed roller on said yoke to a position wholly to one side of the line of feed to provide for feeding engagement of said parts with the workpiece in either position.

11. In a sewing machine, the combination with feed dogs and a cooperable presser foot having a predetermined line of feed, of an auxiliary puller-feed roller; and means including a fixed yoke mounting said auxiliary puller-feed roller to the rear of the feed dogs for feeding a workpiece leaving the feed dogs and presser foot, said auxiliary puller-feed roller having a work-engaging surface and said mounting means including

adjustable means connected to the roller for shifting the said work-engaging roller laterally on the yoke to position said work-engaging member either substantially in the line of feed of said feed dogs or to one side of said line of feed of said feed dogs.

CLARENCE R. NELSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,238,197	Rontke	Aug. 28, 1917
1,406,984	Horton	Feb. 21, 1922
1,959,707	Cooper et al.	May 22, 1934
1,973,608	Christensen et al.	Sept. 11, 1934
2,290,123	Wilfong	July 14, 1942
2,325,643	Weiss	Aug. 3, 1943
2,535,234	Schwartz	Dec. 26, 1950